



FOREST PEST MANAGEMENT

Pacific Southwest Region

Report No. 82-40

3430 Evaluation
November 23, 1982

AN EVALUATION OF GRAY'S PEAK PLANTATION, ALMANOR RANGER DISTRICT LASSEN NATIONAL FOREST

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ABSTRACT

Evaluation of Jeffrey pine exhibiting tip and branch dieback over a 10-15 acre area of the Gray's Peak Plantation identified the gouty pitch midge, Cecidomyia (Retinodiplosis) piniinopis, and brush competition as the primary problems. The western pine shoot borer, Eucosma sonomana, is also suspected to be in the plantation at low levels. Pest management alternatives for consideration by the District in making decisions relative to pine plantation management are presented.

INTRODUCTION

On August 4, 1982, at the request of Duane Nelson, Almanor Ranger District, John Wenz and John Pronos of the Forest Pest Management (FPM) Staff examined a section of the Gray's Peak Plantation where Jeffrey pine were exhibiting tip and branch dieback and some mortality had occurred. They were accompanied by Charles Little of the Almanor District and Ken Estes, Forest Silviculturist. The 212 acre plantation is composed of 21-to-23 year old Jeffrey and sugar pine saplings and poles; the site is a Dunning Class II. The plantation was pre-commercially thinned 8-10 years ago and is currently at the desired 15 ft. x 15 ft. spacing. The symptoms were first observed in 1981 on a 5-acre section planted to Jeffrey pine and, at the present time, are evident over 10-15 acres in and around the original area. The affected stand is under

intense brush competition. The District's concerns are whether the affected trees will respond to release or whether they should be removed and the area replanted. The objectives of this evaluation were to determine the cause(s) of the tip and branch dieback and offer pest management alternatives for consideration by the District in making decisions relative to plantation management.

OBSERVATIONS/DIAGNOSIS

Many of the Jeffrey pines in the affected part of the plantation had dead tips or "flags" scattered throughout the crown. Some mortality had occurred, primarily among the more suppressed and weaker trees. Examination indicated that much of the damage was due to the gouty pitch midge, Cecidomyia (Retinodiplosis) pininopsis. Removal of the bark showed that most of the dead and dying twigs examined had extensive areas inundated with pitch. In a few cases, individual resin pockers were distinguished and characteristic reddish-orange maggots were seen. Several gouty pitch midge cocoons were present on the foliage. No diseases or other insects, (as evidenced by the absence of galleries, webbing and/or boring dust) were found associated with the damage.

In addition, two Jeffrey pines were observed to have a slight swelling and some pitch flow on the bole at the base of one or two internodes. The growth of the affected internodes appeared somewhat reduced relative to nearby, symptomless trees. These symptoms were not evident on other trees, but may be an indication that the western pine shoot borer, Eucosma sonomana, is present in the plantation, at least in low numbers.

In summary, the two primary problems found in the part of the plantation examined were the gouty pitch midge and brush competition.

BIOLOGY

The gouty pitch midge has a transcontinental distribution. In the west, its hosts are ponderosa pine (Pinus ponderosa) and Jeffrey pine (P. Jeffreyi). The midge has a one-year life cycle. Adults are active in the spring (March - May) and lay their eggs, singly or in small groups, on the tips of expanding branches and leaders. After hatching, the larvae bore through the surface of the shoot until completely embedded in vascular tissue. They hollow out a cavity or pit that becomes filled with resin in which the larvae feed over the winter. When the larvae become mature the following spring, they leave the feeding pit and crawl onto the needles where they pupate in characteristic white cocoons which frequently remain on the needle after the next-generation adults have emerged.

Gouty pitch midge populations often fluctuate markedly from year to year. Damaging population levels do not usually occur in a given area for more than 2-3 successive years, although they may be somewhat more

they should be able to "outgrow" the damage and thus reduce the impacts of midge attacks, particularly when considered over an entire rotation. Relatively few trees, mostly those already severely suppressed, appeared affected by midge attacks to the extent that there is a high probability of them dying or that recovery to a merchantable condition over the rotation would be unlikely. Chances of significant mortality due to secondaries should also decrease as a result of the release treatment. The area infested may still increase somewhat, but the effects on newly attacked trees that have been released from brush competition will be less than on poorly growing, less vigorous hosts. The likelihood that pitch midge related problems will recur following this treatment is relatively low since heavy damage is more infrequent on trees above 20 ft. in height. In short, the release treatment already scheduled for the plantation should have additional benefits beyond the original objectives in the form of reduced gouty pitch midge impacts.

2) Prevention. With the exception of preventing competition from brush, no specific prevention alternatives are available for gouty pitch midge on Jeffrey pine. However the following, which applies to pitch midge on ponderosa pine, is included for future considerations. Pronounced differences in susceptibility to attack by the gouty pitch midge have been observed between individual ponderosa pine host trees. The differences are related to the nature of the surface of the spring shoots. Three surface types have been recognized; smooth and dry (glabrous), waxy (glaucous) or sticky and resinous (viscid). The latter, which have comprised about one-third of the trees in the stands studied, are more susceptible to attack by the midge than either the smooth or the waxy types. These differences are most evident in the spring during the active period of new shoot growth. This characteristic (sticky, resinous shoots) should be utilized as an additional tree selection criterion during commercial and pre-commercial thinnings. It may also be a consideration in the selection of ponderosa pine seed trees and the selection of planting stock.

3) Chemical Control. To date, few tests of insecticides designed to reduce the impact of the gouty pitch midge in pine plantations have been conducted and no chemicals are currently available for operational use.

4) Surveillance/Monitoring for the Western Pine Shoot Borer. Since some indication of western pine shoot borer presence was observed, field personnel should be alert for signs of shoot borer activity in pine plantations. It can be difficult to detect as it does not kill the tree or necessarily cause any foliage fading or dieback of the terminals. The following symptoms are characteristic of western pine shoot borer attack: a) leader growth is stunted; b) internode length is shortened; c) leader is often overtopped by laterals; d) needles shortened and needle bundles are more closely spaced than normal resulting in the foliage having a very dense appearance and e) there may be a slight swelling in the lower third of the bole, often near the base of the infected internodes, sometimes with pitch exudation. The potential impact of the western pine shoot borer on pine plantations is currently under investigation, and, pending the results, it remains necessary to maintain surveillance for, and report its presence in, plantations.

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AUG 16 1984

FOREST PEST
MENT STAFF

John Weng - FPM

8/14/84

As you may recall, you were on the Lassen on the Gray's PK plantation with John Pronovost. ^{AUG 1982} You identified the gouty pitch midge as the problem in report No. 82-40. You saw the brush mowing that was going on at the time.

I looked at the plantation yesterday, two growing seasons after release. The trees look good with good color, needle length and needle retention. Height growth is maintaining itself.

The insect is still active, but on scattered twigs of individual trees rather than most twigs as in 1982. The infested trees look like the picture on page 70 of Keen's pub 273.

I didn't see any evidence of western pine shoot borer.

Brush regrowth has occurred since the mowing, but it is not very vigorous and shouldn't be a continuing problem.

Ken Estes - Lassen N.F.

